Claims

1. Method for processing electrical components (2, 40), which are releasably held on a first carrier formed by a carrier foil (3) in an array forming a plurality of first rows (R1 – Rn), whereby at least some of the first rows (R1 – Rn) contain at least two components (2, 40) and whereby the components (2, 40) are each picked up by at least one pick-up element (5, 5a, 5b, 5c) from the carrier foil (3) and placed on a second carrier (6, 6c), **characterized** in that in each work stroke, a group of at least two components (2, 40) is simultaneously picked up from the carrier foil (3) and placed on the second carrier (6, 6c) by means of the pick-up element (5, 5a, 5b, 5c).

2. Method according to claim 1, characterized in that the components are semiconductor chips (2) and that the array of components on the carrier foil (3) is a semiconductor wafer (1) separated or divided into the semiconductor chips (2).

3. Method according to claim 1, characterized in that the components are electrical components, preferably semiconductor components (40) provided with an extruded housing.

4. Method according to one of the foregoing claims, characterized in that the components (2, 40) are placed on the second carrier (6, 6c) so that they form at least one row on said carrier, in which (row) the components (2, 40) adjoin each other in a first axis direction (Y-axis).

5. Method according to one of the foregoing claims, characterized in that the first rows (R1 – Rn) on the carrier foil (3) are each oriented in a common first axis direction (Y) or in a second axis direction (X-axis) extending perpendicular to the first axis direction.

6. Method according to one of the foregoing claims, characterized in that the first rows (R1 – Rn) on the carrier foil (3) have different lengths.

7. Method according to one of the foregoing claims, characterized in that the first rows (R1 – Rn) at least partially display varying distances from their beginning and/or end from a reference line (BL) that is common to all first rows (R1 – Rn) and extends perpendicular to the longitudinal extension of these rows.

8. Method according to one of the foregoing claims, characterized in that for the formation of the at least one second row (R'1 – R'n) on the second carrier (6, 6c), the pick-up head (5, 5a, 5b, 5c), for picking up the respective group of components from the carrier foil (3) and for placing this group of components on the second carrier (6, 6c), controlled by an electronic control unit (9), executes a different movement stroke (Hx, Hy), namely based on the position and/or number of the components (2, 40) respectively picked up from the carrier foil (3).

9. Method according to one of the foregoing claims, characterized in that the components (2, 40) are picked up from the carrier foil (3) by rows, and corresponding to the first rows (R1 – Rn).

10. Method according to one of the foregoing claims, characterized in that for each work stroke of the pick-up element (5, 5c), only components (2, 40) from a first row (R1 – Rn) are picked up from the carrier foil (3).

11. Method according to one of the foregoing claims, characterized in that for each work stroke, components (2, 40) from two first rows (R1 – Rn) are picked up from the carrier foil (3) and placed on the second carrier (6, 6c).

12. Method according to one of the foregoing claims, characterized by a forward feed (B) for the carrier foil (3) in an axis direction extending perpendicular to the

longitudinal extension of the first rows (R1 – Rn), for example in the second axis direction (X-axis).

13. Method according to one of the foregoing claims, characterized in that for the formation of at least two second rows (R'1 – R'n), the pick-up element (5, 5a, 5b, 5c) is also movable at least in one axis direction (X-axis) crosswise to the longitudinal extension of the at least two second rows (R'1 – R'n).

14. Method according to one of the foregoing claims, characterized in that the components (2, 40) in the array (1) on the carrier foil (3) are electrically and/or mechanically measured or tested and that all components (2, 40) are transferred from the carrier foil (3) to the second carrier (6, 6c), so that any defective components are sorted out only afterwards during the measurement or test.

15. Method according to one of the foregoing claims, characterized by the use of a pick-up element (5, 5a, 5b, 5c), which comprises at least two fixtures (2) in at least one row for one component (2, 40) each.

16. Method according to one of the foregoing claims, characterized by the use of a pick-up element (5, 5a, 5c), which comprises at least two rows with at least two fixtures (17) each for one component (2, 40) each.

17. Method according to one of the foregoing claims, characterized in that the fixtures are formed by bearing surfaces (17) of a multiple vacuum holder.

18. Method according to one of the foregoing claims, characterized by a pick-up element (5, 5a, 5b, 5c) with at least one pick-up head (12, 12a, 12c) designed as a multiple vacuum holder.

19. Method according to claim 18, characterized by the use of a pick-up element (5, 5a, 5b, 5c), in which the pick-up head (12) comprises a plurality of preferably

lamellar-shaped and adjoining vacuum holders (14), which preferably can be moved in a housing (13, 13a', 13a'', 13c', 13c'') in one axis direction, preferably in a third axis direction perpendicular to the plane of the carrier foil (3) and/or to the plane of the second carrier (6, 6c).

20. Method according to one of the foregoing claims, characterized by the use of means (27, 27a, 27b) for releasing the components (2, 40) from the carrier foil (3) upon transfer to the pick-up element (5, 5a, 5b, 5c).

21. Method according to claim 20, characterized in that the means for releasing are formed by needles or rams (27, 27a, 27b), with which the components are released preferably by puncturing the carrier foil (3) from the side of this carrier foil (3) facing away from the components (2, 40) and secured on the pick-up element (5, 5a, 5b, 5c) during the release.

22. Method according to one of the foregoing claims, characterized in that the release of the components in each group of components (2') from the carrier foil (3) takes place in temporal succession.

23. Method according to one of the foregoing claims, characterized in that the second carrier is formed by the transport surface of a transport element (6, 6c).

24. Method according to one of the foregoing claims, characterized by the use of a ram element (11, 11a, 11b), in which several rams or pins (27, 27a, 27b) present in a housing or housing section (23, 23b, 26) are axially movable and can be moved by a control unit from a non-effective starting position into a position releasing the components from the carrier foil (3).

25. Method according to claim 24, characterized in that the control means are formed by control cams (34) and/or by a control curve (38).

26. Method according to one of the foregoing claims, characterized in that the components (2, 40) are picked up for example by means of a flipping station (41) in the second carrier (6, 6c) and fed to a further processing unit, for example to a further transport element (45) or fixtures (44) located there.

27. Device for processing electrical components (2, 40), which are releasably held on a first carrier formed by a carrier foil (3) in an array forming a plurality of first rows (R1 – Rn), whereby at least some of the first rows (R1 – Rn) contain at least two components (2, 40) and whereby the components (2, 40) are each picked up by at least one pick-up element (5, 5a, 5b, 5c) from the carrier foil (3) and placed on a second carrier (6, 6c), characterized by a pick-up element (5, 5a, 5b, 5c) with which in each work stroke a group of at least two components (2, 40) is simultaneously picked up from the carrier foil (3) and placed on the second carrier (6, 6c).

28. Device according to claim 27, characterized in that the components are semiconductor chips (2) and that the array of components on the carrier foil (3) is a semiconductor wafer (1) separated into the semiconductor chips (2).

29. Device according to claim 27, characterized in that the components are electrical components, preferably semiconductor components (40) provided with an extruded housing.

30. Device according to one of the foregoing claims, characterized in that the components (2, 40) are placed on the second carrier (6, 6c) so that they form at least one row on said carrier, in which (row) the components (2, 40) adjoin each other in a first axis direction (Y-axis).

31. Device according to one of the foregoing claims, characterized in that the first rows (R1 – Rn) on the carrier foil (3) are each oriented in a common first axis direction (Y) or in a second axis direction (X-axis) extending perpendicular to the

first axis direction.

32. Device according to one of the foregoing claims, characterized in that the first rows (R1 – Rn) on the carrier foil (3) have different lengths.

33. Device according to one of the foregoing claims, characterized in that the first rows (R1 – Rn) at least partially display varying distances from their beginning and/or end from a reference line (BL) that is common to all first rows (R1 – Rn) and extends perpendicular to the longitudinal extension of these rows.

34. Device according to one of the foregoing claims, characterized in that for the formation of the at least one second row (R'1 – R'n) on the second carrier (6, 6c) the pick-up head (5, 5a, 5b, 5c), for picking up the respective group of components from the carrier foil (3) and for placing this group of components on the second carrier (6, 6c), is controlled by an electronic control unit (9) so that it executes a different movement stroke (Hx, Hy), namely based on the position and/or number of the components (2, 40) respectively picked up from the carrier foil (3).

35. Device according to one of the foregoing claims, characterized in that the pick-up head (5, 5a, 5b, 5c) is controlled by the electric control unit (9) so that the components (2, 40) are picked up from the carrier foil (3) by rows, and corresponding to the first rows (R1 – Rn).

36. Device according to one of the foregoing claims, characterized in that the pick-up head (5, 5a, 5b, 5c) is controlled by the electric control unit (9) so that for each work stroke of the pick-up element (5, 5c) only components (2, 40) from a first row (R1 – Rn) are picked up from the carrier foil (3).

37. Device according to one of the foregoing claims, characterized in that the pick-up head (5, 5a, 5b, 5c) is controlled by the electric control unit (9) so that for

each work stroke components (2, 40) from two first rows (R1 – Rn) are picked up from the carrier foil (3) and placed on the second carrier (6, 6c).

38. Device according to one of the foregoing claims, characterized by a drive for a forward feed (B) for the carrier foil (3) in an axis direction extending perpendicular to the longitudinal extension of the first rows (R1 – Rn), for example in the second axis direction (X-axis).

39. Device according to one of the foregoing claims, characterized in that for the formation of at least two second rows (R'1 – R'n), the pick-up element (5, 5a, 5b, 5c) is also movable at least in one axis direction (X-axis) crosswise to the longitudinal extension of the at least two second rows (R'1 – R'n).

40. Device according to one of the foregoing claims, characterized by a pick-up element (5, 5a, 5b, 5c), which comprises at least two fixtures (2) in at least one row for one component (2, 40) each.

41. Device according to one of the foregoing claims, characterized by a pick-up element (5, 5a, 5c), which comprises at least two rows with at least two fixtures (17) each for one component (2, 40) each.

42. Device according to one of the foregoing claims, characterized in that the fixtures are formed by bearing surfaces (17) of a multiple vacuum holder.

43. Device according to one of the foregoing claims, characterized by a pick-up element (5, 5a, 5b, 5c) with at least one pick-up head (12, 12a, 12c) designed as a multiple vacuum holder.

44. Device according to claim 43, characterized by a pick-up element (5, 5a, 5b, 5c), in which the pick-up head (12) comprises a plurality of lamellar-shaped and adjoining vacuum holders (14), which preferably can be moved in a housing

(13, 13a', 13a'', 13c', 13c'') in one axis direction, preferably in a third axis direction perpendicular to the plane of the carrier foil (3) and/or to the plane of the second carrier (6, 6c).

45. Device according to one of the foregoing claims, characterized by means (27, 27a, 27b) for releasing the components (2, 40) from the carrier foil (3) upon transfer to the pick-up element (5, 5a, 5b, 5c).

46. Device according to claim 45, characterized in that the means for releasing are needles or rams (27, 27a, 27b), with which the components are released preferably by puncturing the carrier foil (3) from the side of this carrier foil (3) facing away from the components (2, 40) and secured on the pick-up element (5, 5a, 5b, 5c) during the release.

47. Device according to one of the foregoing claims, characterized in that the release of the components in each group of components (2') from the carrier foil (3) takes place in temporal succession.

48. Device according to one of the foregoing claims, characterized in that the second carrier is formed by the transport surface of a transport element (6, 6c).

49. Device according to one of the foregoing claims, characterized by a ram element (11, 11a, 11b), in which several rams or pins (27, 27a, 27b) present in a housing or housing section (23, 23b, 26) are axially movable and can be moved by a control unit from a non-effective starting position into a position releasing the components from the carrier foil (3).

50. Device according to claim 49, characterized in that the control means are formed by control cams (34) and/or by a control curve (38).

51. Device according to one of the foregoing claims, characterized in that the

components (2, 40) are picked up for example by means of a flipping station (41) in the second carrier (6, 6c) and fed to a further processing unit, for example to a further transport element (45) or fixtures (44) located there.